

Remarks

Reconsideration of this Application is respectfully requested.

Claims 1-17 are pending in the application, with claims 1 and 7 being the only independent claims.

Based on the following remarks, Applicants respectfully request that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

Rejections Under 35 U.S.C. §103

Claims 1-3, 5, 7-9, 11 and 15 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,648,546 to Gellert ("Gellert") in view of U.S. Patent No. 5,973,296 to Juliano et al. ("Juliano") and further in view of U.S. Patent No. 5,569,474 to Kitaichi et al. ("Kitaichi"). Claims 4, 6, 10 and 12 are rejected under 35 U.S.C. §103(a) as being unpatentable over the Gellert, Juliano, and Kitaichi combination and further in view of U.S. Patent No. 6,305,923 to Godwin et al. ("Godwin"). The Examiner asserts that the Gellert patent teaches an injection molding apparatus that includes a melt distribution manifold having a wire type manifold heater. Office Action pp. 2-3. The Examiner acknowledges that the Gellert patent does not teach the use of a planar film heater on an exterior surface of a manifold or its characteristics. Office Action p. 3. The Examiner asserts, *inter alia*, that the Juliano patent teaches a film heater for an injection mold nozzle, and that the Kitaichi patent teaches a *planar* film heater. Office Action pp. 3-4. The Examiner states that it would have been obvious to one of ordinary skill in the art to have modified the manifold heater of Gellert by the teaching of the nozzle heater of Juliano "to provide more efficient external heating,

provide better temperature control, provide increased flexibility for heater element design, and allow integration of sensors", and to further modify Gellert by "adding the planar film heater along a mold manifold, as disclosed by Kitaichi et al., in order to provide rapid surface heating for a mold used for injection molding of plastics, such that defects in the molded product occur less frequently." Office Action, p. 4. With respect to claims 4, 6, 10, and 12, the Examiner states that "[o]ne would have been motivated to provide an additional wire heater at the exit of the manifold to ensure that melt leaving the manifold and entering the nozzle has not cooled undesirably and is at the proper temperature for injection into mold cavities." Office Action, p. 5. Applicants respectfully traverse the rejections.

Neither Gellert, Juliano, nor Kitaichi alone or in combination teaches a planar film heating element coupled to an exterior surface of a manifold as claimed by Applicants. Gellert teaches embedding an electrical heating element (item 58) in a channel (item 56) milled in an upper surface (item 54) of a manifold. Gellert patent, col. 4, lines 39-41; FIGS. 4-6. The heating element is recessed into the manifold surface and metallurgically bonded therein "to disperse heat rapidly away from the [heating] element 58 [that] avoids the creation of hot spots along the heating element and applies the heat more uniformly along the melt passage 12". Gellert patent, col. 5, lines 29-32 and 39-45; FIG. 6. Juliano teaches a tubular heating sheath (6) *for sliding over* a tubular *nozzle* body, wherein a spirally wound resistive wire element (item 8 in FIG. 1, see also FIG. 2B) is replaced by a thick film tubular heater (item 40 in FIG. 2A). Juliano patent, col. 5, lines 42-46; col. 6, lines 5-8. As shown in FIG. 4, 4A and 4B, the Juliano thick film tubular heater core (item 48) is coaxially disposed about the tubular nozzle body (item

32). Juliano patent, col. 6, lines 37-47.

According to Juliano, such a nozzle heater arrangement reduces the bulkiness of the nozzle and decreases the size of the nozzle. Juliano patent, col. 1, lines 45-66. As such, Applicants do not agree that there would have been motivation to one of ordinary skill in the art to modify an embedded manifold heater as disclosed in the Gellert patent with a thick film tubular nozzle heater as disclosed in the Juliano patent to arrive at the Applicants' claimed invention. Particularly, the problem to be solved by a smaller profile tubular nozzle heater as disclosed in Juliano is not relevant to an embedded manifold heater as disclosed in Gellert.

Kitaichi does not cure the deficiencies in the Juliano patent. Kitaichi discloses a thin film electric resistor (10) formed on a wall surface of a mold cavity that contacts the molten plastics (9) to heat the molten plastics (9) *directly*. See col. 10, lines 21-24 and 35-38. Thus, the thin film electric resistor of Kitaichi is disposed on an *interior* surface of the *mold cavity*. Kitaichi does not teach or suggest mounting a thin film electric resistor to a *manifold*, nor does it teach or suggest mounting such a thin film electric resistor to an *exterior* surface of a manifold.

Further, one of ordinary skill in the art would not have been motivated to combine the teachings of Kitaichi with Gellert and Juliano. The Examiner's alleged motivation to combine Kitaichi with Gellert and Juliano is inconsistent with the teaching of Kitaichi taken as a whole. In particular, the Examiner asserts it would have been obvious to one of ordinary in the art to add "the planar film heater along a mold manifold, as disclosed by Kitaichi et al., in order to provide rapid surface heating for a mold used for injection molding of plastics, such that defects in the molded product

occur less frequently." However, as noted above, the Kitaichi patent teaches that such a benefit occurs when the thin film electric resistor is provided on the wall surface of the mold *into* which the molten plastics is injected such that there is a *direct* heat exchange between the heat source and the molten plastics. Col. 5, lines 12-16. Further, Kitaichi teaches that the thin film electric resistor heats *only* the surface of an object rapidly. Col. 3, lines 65-66. Thus, one of ordinary skill in the art relying upon Kitaichi would not have been motivated to place a thin film electric resistor on an *exterior* surface of a manifold because it would not be in *direct* contact with the molten plastics and only the *exterior* surface of the manifold would be heated rapidly. Since the molten plastics running through the manifold is what needs to be heated, heating only the exterior surface would not be sufficient. Thus, Applicants respectfully submit that one of ordinary skill in the art would not have been motivated to modify the heater of Gellert based on the teachings of Kitaichi, and even if so motivated, one of ordinary skill in the art would not have used the thin film electric resistor of Kitaichi on an exterior surface of the manifold, as claimed.

For the reasons stated above, Applicants respectfully request that the rejection of claims 1-3, 5, 7-9, 11, and 15 be withdrawn.

With respect to claims 4, 6, 10 and 12, they depend directly or indirectly from claims 1 or 7, and are therefore allowable for at least the same reasons as claims 1 and 7, discussed above. Further, the Godwin patent does not cure the deficiencies in the Gellert, Juliano, Kitaichi combination discussed above. In particular, Godwin discloses the use of film heaters placed *within* a manifold on or about the manifold channels, as depicted in FIGS. 4, 6, 8A and 20. Godwin, col. 6, line 60-col. 7, line 11; col. 9, lines

41-64; col. 12, lines 46-50. Further, Godwin states that placing the film heaters in or on the manifold melt channels attempts to cure a problem in "prior art manifold heating apparatuses, [in that] a significant proportion of the heat generated by the heaters is wasted heating the entire manifold block rather than directly heating the resin flowing in a melt channel contained therein." Godwin, col. 1, lines 45-49. Accordingly, Applicants respectfully request that the rejection be withdrawn.

Allowable Claims

Applicants thank the Examiner for indicating that claims 13, 14, 16, and 17 would be allowable if rewritten in independent form including all the limitations of the base claims and any intervening claims. In view of the remarks above, Applicants have not rewritten claims 13, 14, 16, and 17 in independent form because Applicants respectfully submit that the claims from which they depend are allowable over the cited art, as explained above.

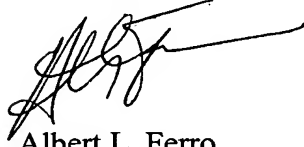
Conclusion

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Reply is respectfully requested.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.

A handwritten signature in black ink, appearing to read 'A. Ferro', with a long horizontal flourish extending to the right.

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